SIZE AND EFFICIENCY

KEYS TO PROFITABLE PORK PRODUCTION

by

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Introduction

1975 was an unusually profitable year for Ohio pork producers. Some producers, however, were more successful than others. This is evident from an analysis of the information submitted by Ohio swine farmers cooperating in The Ohio Cooperative Extension Service farm record project. The data for the farrow-to-finish enterprise were separated from the rest of the farm on twenty-three farms. These data were analyzed to determine, among other items, the profitability of the enterprise. The average return to operator labor and management from these enterprises amounted to $39,000 (see Table 1); the average return per hour to operator labor and management was to $19. The return to operator labor and management was calculated after paying all cash expenses (feed, hired labor, depreciation, and interest on capital).

Table 1. PROFITABILITY OF FARROW-TO-FINISH ENTERPRISE

23 OHIO FARMS - 1975

Item	Return to Labor and Management	
	Total 1/	Per Hour
Lowest	$ 5,000	$ 4
Average	39,000	19
Highest	192,000	44

Source: Farm record project

1/ Rounded to nearest 1000.

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As expected there was wide variation in profitability among farms. The least profitable enterprise included in the analysis returned $5,000 to labor and management while the most profitable returned $192,000. The lowest return per hour was $4 and the highest was $44. Because of the management implications of these differences, the data were analyzed to determine the factors responsible for this variation.

FACTORS INFLUENCING PROFIT

Many factors influence the profitability of a farrow-to-finish enterprise. They can be classified in two groups: those under the control of management and those not under the control of management. The factors not under the control of management (primarily prices, weather, etc.) are relatively constant for all producers and are not responsible for the variation in profit, evident in Table 1. On the other hand, those factors controlled by management influence profit and can help explain this variation.

The most important factors that management controls are enterprise selection, size, efficiency, and marketing strategy. Size and efficiency considerations are examined in this analysis.

SIZE

There are numerous ways to measure the size of a farrow-to-finish enterprise. Two of the more meaningful measures of size are the number of sows and gilts and the number of pounds of pork sold. The information in Tables 2 and 3 demonstrates the relationship between thw size and profitability of the enterprise. The data presented in Tables 2 and 3 clearly indicate that the larger enterprises were more profitable.

Number of Sows

Relating the number of sows and gilts to total return (Table 2) we find the smaller enterprises (fifteen to forty-nine sows) returned an average of $13,000 to labor and management. The larger enterprises, those with fifty to ninety-nine and those with one hundred or more sows and gilts, returned $26,000 and $82,000 respectively. One of the reasons for this difference is the ability of larger producers to achieve economies of size. That is, average cost of production declines as size increases.

Table 2. RELATION BETWEEN NUMBER OF SOWS, AND RETURN TO LABOR AND MANAGEMENT 23 OHIO FARMS - 1975

Number of Sows and Gilts	Number of Farms	Average Number of Sows and Gilts	Average Return to Labor & Management	
			Total[1/]	Per Hour
15 - 49	7	25	$13,000	$18
50 - 99	9	64	26,000	21
100 or more	7	172	82,000	24

Source: Farm record project.

1/ Rounded to nearest 1000.

Pounds of Pork Sold

The results presented in Table 3 indicate the same general relationship; the larger enterprises were more profitable. Those enterprises selling less than 75,000 pounds of pork returned an average of $20,000 to labor and management. Those that sold 75,000 to 249,999 pounds and those selling 250,000 pounds or more returned $24,000 and $91,000 respectively. Much of the increase in total return to labor and management associated with increasing size is clearly the result of more numbers simply multiplying the profit. Analyzing the data on a per hour basis tends to remove this multiplier effect.

Table 3. RELATION BETWEEN PORK SOLD AND RETURN TO LABOR AND MANAGEMENT

23 OHIO FARMS - 1975

Pounds of Pork Sold	Number of Farms	Average Pounds of Pork Sold[1/]	Average Return to Labor & Management	
			Total[1/]	Per Hour
Less than 75,000	6	49,000	$20,000	$17
75,000 - 249,999	8	151,000	24,000	21
250,000 or more	9	385,000	91,000	23

Source: Farm record project.

1/ Rounded to nearest 1000.

Removing the size multiplier (see average return per hour data in Tables 2 and 3) did not change the relationship between size and profitability; the larger enterprises were more profitable. The average return per hour to labor and management increased from eighteen to twenty-one to twenty-four dollars as the average herd size increased from twenty-five to sixty-four to one-hundred seventy-two sows and gilts respectively. Using pounds of pork sold as the measure of size did not change this relationship. As the average pounds of pork sold increased from 49,000 to 151,000 to 385,000 the returns per hour increased from seventeen to twenty-one to twenty-three dollars.

Profitability is clearly associated with the size of the farrow-to-finish swine enterprise. It must be noted, however, that increasing the size of an enterprise does not insure an increase in profit. The information in Table 4 illustrates this point.

Table 4. VARIATION IN RETURN TO LABOR AND MANAGEMENT

23 OHIO FARMS - 1975

Number of Sows and Gilts	Return to Labor and Management			
	Total[1/]		Per Hour	
	Lowest	Highest	Lowest	Highest
15 - 49	$7,000	$ 31,000	$8	$30
50 - 100	5,000	60,000	4	44
100 or more	6,000	192,000	6	44

Source: Farm record project.

1/ Rounded to nearest 1000.

One of the smaller enterprises earned $31,000 while one of the largest enterprises only earned $6,000. Likewise, one of the smaller enterprises returned $30 per hour and one of the larger enterprises only earned $6 per hour. Size is only one of a number of factors that influence, but don't guarantee, profitability. The other factors are referred to as efficiency factors.

EFFICIENCY

Efficient use of the factors of production is a must if a producer is to generate a profit from the production of pork. Producers are most concerned about efficient use of capital, labor, feed, and sows. The only measure of efficiency found to be clearly related to profit was labor. The limited number of farms in this study and the lack of detailed data made it difficult to analyze the other factors in sufficient detail. It is possible, however, that other factors may also be related to profitability.

Labor

The best measure of labor efficiency in a farrow-to-finish enterprise is pounds of pork sold per man. The information in Table 5 demonstrates a strong relationship between pork sold per man and profits.

Table 5. RELATION BETWEEN PORK SOLD PER MAN AND RETURN TO LABOR AND MANAGEMENT

23 OHIO FARMS - 1975

Pounds of Pork Sold Per Man	Number of Farms	Average Pounds of Pork Sold Per Man 1/	Average Return to Labor and Management	
			Total 1/	Per Hour
Less than 200,000	6	171,000	$17,000	$16
200,000 - 249,999	10	224,000	28,000	21
250,000 or more	7	281,000	82,000	25

Source: Farm record project.

1/ Rounded to nearest 1000.

The farms that used labor most efficiently (sold more pounds of pork per man) were most profitable. The least efficient farms (those that sold less than 200,000 pounds of pork per man) sold an average of 171,000 pounds per man and returned an average of $17,000 to labor and management. Those farms that sold 200,000 to 249,999 pounds per man sold an average of 224,000 pounds per man and earned an average return to labor and management of $28,000. The farms selling 250,000 pounds per man sold an average of 281,000 pounds per man and earned an average $82,000. On a per hour basis (an attempt to remove the direct influence of size) these groups of farms earned sixteen, twenty-one, and twenty-five dollars per hour respectively.

Another labor efficiency is sows per man. The information in Table 6 demonstrates the relationship of this measure of labor efficiency with profitability.

Table 6. RELATION OF SOWS PER MAN AND RETURN TO LABOR AND MANAGEMENT

23 OHIO FARMS - 1975

Number of Sows and Gilts Per Man	No. of Farms	Average Sows and Gilts Per Man	Average Ret. to Labor & Mgmt. Total[1]	Per Hour
Less than 80	7	67	$23,000	$22
80 - 100	9	89	51,000	23
100 or more	7	135	37,000	17

Source: Farm record project.

[1]/Rounded to nearest 1000.

The results of this analysis indicate that more sows per man is more profitable, up to a point. Those farms with eighty to one-hundred sows per man earned more than those farms with less than eighty sows per man. The results seem to indicate that those farms that were most efficient (one hundred or more sows per man) earned less. It's possible that on some of these farms labor was trying to accomplish too much (take care of too many sows), resulting in poor performance. The results do illustrate an important point; however, Sows per man is not a very good indicator of profitability. From a business management viewpoint we are interested in output per man. Sows per man does not measure output. However, when we measure efficiency in terms of output (pounds of pork), efficient use of labor is clearly a good indicator of profits.

Feed Efficiency

The data supplied by the farm records project did not permit an analysis of the relationship between feed efficiency and profitability. If the data had been available the expected relationship would be that those farms with less feed per pound of pork produced would be most profitable. There was, however, data for an analysis of sow and capital efficiency. The results, however, are of limited usefulness.

Sows

Sow efficiency, measured by pigs weaned per litter, did not appear to have a clearly defined relationship to return per hour. There did, however, seem to be a positive relationship between total earnings from the enterprise and pigs weaned per litter (see Table 7). The same was true when sow efficiency was measured in terms of pigs weaned per sow per year (see Table 8).

Table 7. RELATION BETWEEN PIGS WEANED PER LITTER AND RETURNS TO LABOR AND MANAGEMENT

23 OHIO FARMS - 1975

Pigs Weaned Per Litter	No. of Farms	Average Pigs Weaned Per Litter	Average Ret. to Labor & Mgmt. Total[1]	Per Hour
Less than 7.0	5	5.9	$16,000	$20
7.0 - 7.9	9	7.4	33,000	23
8.0 or more	9	8.5	58,000	20

Source: Farm record project.

1/Rounded to nearest 1000.

Those enterprises weaning the least number of pigs per litter (less than 7.0) averaged just under six (5.9) and returned $16,000 to labor and management. As the number of pigs weaned per litter increased to the range of 7.0 to 7.9 the average increased to 7.4 and returns increased to $33,000. A further increase in pigs weaned per litter (8.0 or more) was associated with a still higher total return to labor and management ($58,000). The return per hour increased as the pigs weaned per litter increased from less than 7.0 to the range of 7.0 to 7.9. Increased labor required is a possible explanation, for the decrease in earnings per hour as pigs weaned per litter increased to 8.0 or more. In any event, the relationship between pigs weaned per litter and return per hour to labor and management is probably not very strong within the range of these data.

Table 8. RELATION BETWEEN PIGS WEANED PER SOW PER YEAR AND RETURNS TO LABOR AND MANAGEMENT

23 OHIO FARMS - 1975

Pigs Weaned Per Sow Per Year	No. of Farms	Average Pigs Weaned Per Sow Per Year	Average Return to Labor & Mgmt.	
			Total[1/]	Per Hour
Less than 10	7	7.7	$23,000	$23
10.0 to 12.9	7	11.6	28,000	18
13.0 or more	9	14.6	60,000	21

Source: Farm record project.

1/ Rounded to nearest 1000.

The enterprises that made more efficient use of their sows (weaned more pigs per sow per year) were more profitable. Those weaning less than ten pigs per sow per year returned $23,000 to labor and management. As the number of pigs weaned per sow per year increased to a range of 10.0 to 12.9 earnings increased to $28,000. Further increases in pigs weaned per sow per year (more than 13.0) resulted in considerably higher earnings, $60,000. Increasing the pigs weaned per sow per year resulted in lower costs per pig and higher total returns to labor and management. The analysis did not indicate a consistent relationship between pigs per sow per year and labor and management return per hour.

Capital

The relationship between capital efficiency (investment per hundred weight of pork sold) and return to labor and management was examined. It is not clear from the results what relationship existed (see Table 9).

Table 9. RELATION BETWEEN INVESTMENT PER CWT. OF PORK SOLD AND RETURN TO LABOR AND MANAGEMENT

23 OHIO FARMS - 1975

Investment Per Cwt. Pork Sold	Number of Farms	Average Investment Per Cwt. Pork Sold	Average Return to Labor & Management	
			Total[1/]	Per Hour
Less than $35	8	$26	$34,000	$19
$35 - $50	7	41	36,000	29
More than $50	8	67	47,000	16

Source: Farm record project.

1/ Rounded to nearest 1000.

Those enterprises with the largest amount of capital invested per hundred weight of pork sold (more than fifty dollars) had, on the average, the most profitable enterprises. Presumably the high amount of capital permitted a larger enterprise because labor was used more efficiently. The highest return per hour, however, was earned on those farms where capital invested per hundred weight of pork sold was in the thirty-five to fifty dollar range. As might be expected the return per hour increased as the capital invested increased from less than thirty-five to between thirty-five and fifty dollars per hundred weight sold. The results also seem to indicate that too much or too little capital can be employed if a person were interested in maximizing his return per hour of labor.

SUMMARY

Size and efficiency do explain some of the variation in the profitability of the farrow-to-finish enterprise among farms. Neither, however, guarantees profits, but those enterprises that were larger and used inputs more efficiently were generally more profitable. In this analysis, the larger enterprises (100 or more sows)(250,000 or more pounds of pork sold) were the most profitable. The larger size resulted in a lower cost of production by spreading the overhead and multiplied the profit generated on each animal sold. Efficient use of resources (sows and labor) on these farms resulted in higher earnings. Those enterprises using labor most efficiently (more than 250,000 pounds of pork sold per man) were the most profitable. Selling more pork per man reduces the labor cost per pound of pork sold and results in higher profits. The data in this analysis indicates a reduction in profitability as managers attempted to increase sows per man beyond 100. The additional labor efficiency (more sows per man), in all likelihood, came at the expense of fewer litters per sow per year, fewer pigs saved per litter, and more feed per pound of pork sold. These results were translated into higher costs and lower profits. Using sows more efficiently (more pigs weaned per sow per year) resulted in higher returns to operator labor and management. The increased sow efficiency reduced the cost of production by spreading the overhead expense incurred to maintain sows and boars (buildings, feed, supplies, labor, etc.). Increasing the amount of capital per pound of pork sold (decreasing its efficiency of use) resulted in higher earnings. Assumably the higher amount of capital was a substitute for labor resulting in a larger enterprise using labor more efficiently. The increased size and more efficient use of labor resulted in higher returns to operator labor and management.